ONLINE SUPPLEMENT FOR:

Changes in otoacoustic emissions during selective auditory and visual attention

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Published in The Journal of the Acoustical Society of America, 2015

KEY WORDS: cochlear efferents, auditory attention, visual attention, otoacoustic emissions

PACS numbers: 43.64.Jb, 43.64.Kc, 43.64.Bt, 43.64.Nf, 43.66.Lj

Digital Object Identifier: DOI: 10.15781/T2WC7K

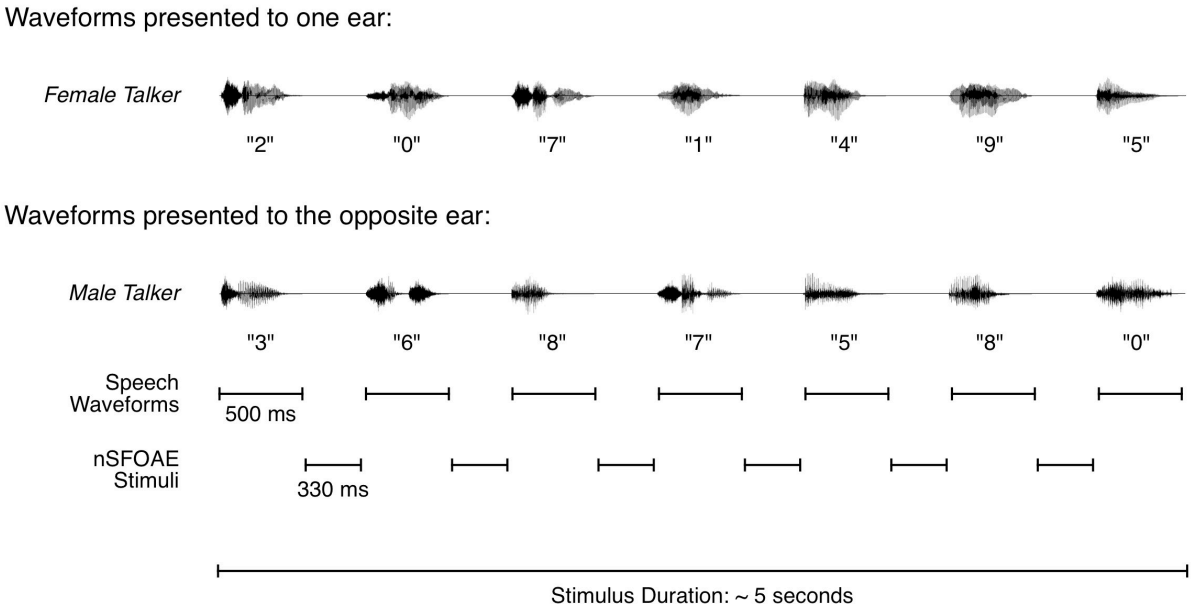

Figure S1. An example of the stimulus waveforms presented to the ears during one trial of the dichotic-listening condition in the auditory study. Each ear was presented with a series of seven spoken digits, one series spoken by a female talker, and the other series spoken simultaneously by a male talker. The ear receiving the female talker was selected randomly on each trial. Each digit was presented in a 500-ms temporal window, and a 330-ms ISI separated consecutive digits. Although not shown here, the nSFOAE-eliciting stimuli were presented during the ISIs, and a 2000-ms silent response interval and a 200-ms feedback interval completed each trial. During the response interval, the subject performed a two-alternative matching task based on the digits spoken by the female talker. [Reprinted with permission from Walsh et al. (2014a).]

Table SI: Reaction Times in the Auditory Conditions, by Trial Outcome

Subject	Condition:	Inattention	Dichotic	Diotic
L01	All Trials	490.1	1255.5	1240.4
	Correct		1222.4	1198.0
	Incorrect		1473.3	1443.1
L02	All Trials	1487.8	1341.2	1313.4
	Correct		1290.1	1265.2
	Incorrect		1491.0	1474.3
L03	All Trials	360.5	1204.5	1223.5
	Correct		1181.2	1190.4
	Incorrect		1589.4	1672.6
L04	All Trials	228.3	1241.4	1297.5
	Correct		1215.0	1286.0
	Incorrect		1592.4	1407.4
L05	All Trials	955.4	1199.6	1193.1
	Correct		1193.1	1185.2
	Incorrect		1644.2	1354.5
L06	All Trials	996.4	1385.7	1399.1
	Correct		1358.0	1384.2
	Incorrect		1501.2	1484.6
L07	All Trials	404.9	1466.7	1461.9
	Correct		1442.9	1438.8
	Incorrect		1590.1	1608.5
L08	All Trials	772.4	1476.0	1360.5
	Correct		1442.9	1351.5
	Incorrect		1596.3	1392.6
AVG (n=8)	**All Trials**	**712.0**	**1321.3**	**1311.2**
	Correct		**1293.2**	**1287.4**
	Incorrect		**1559.7**	**1479.7**

Table SI: Average reaction times (ms) for the 8 subjects in the auditory-attention conditions. For each subject and each condition, RTs were averaged across all trials, and for correct and incorrect trials separately. For the inattention condition, all trials were treated as correct. For each of the three conditions, average RTs across all subjects are shown at the bottom of the table. RTs for the inattention condition were significantly faster than in the attention conditions, and RTs in the dichotic and diotic conditions did not differ significantly.

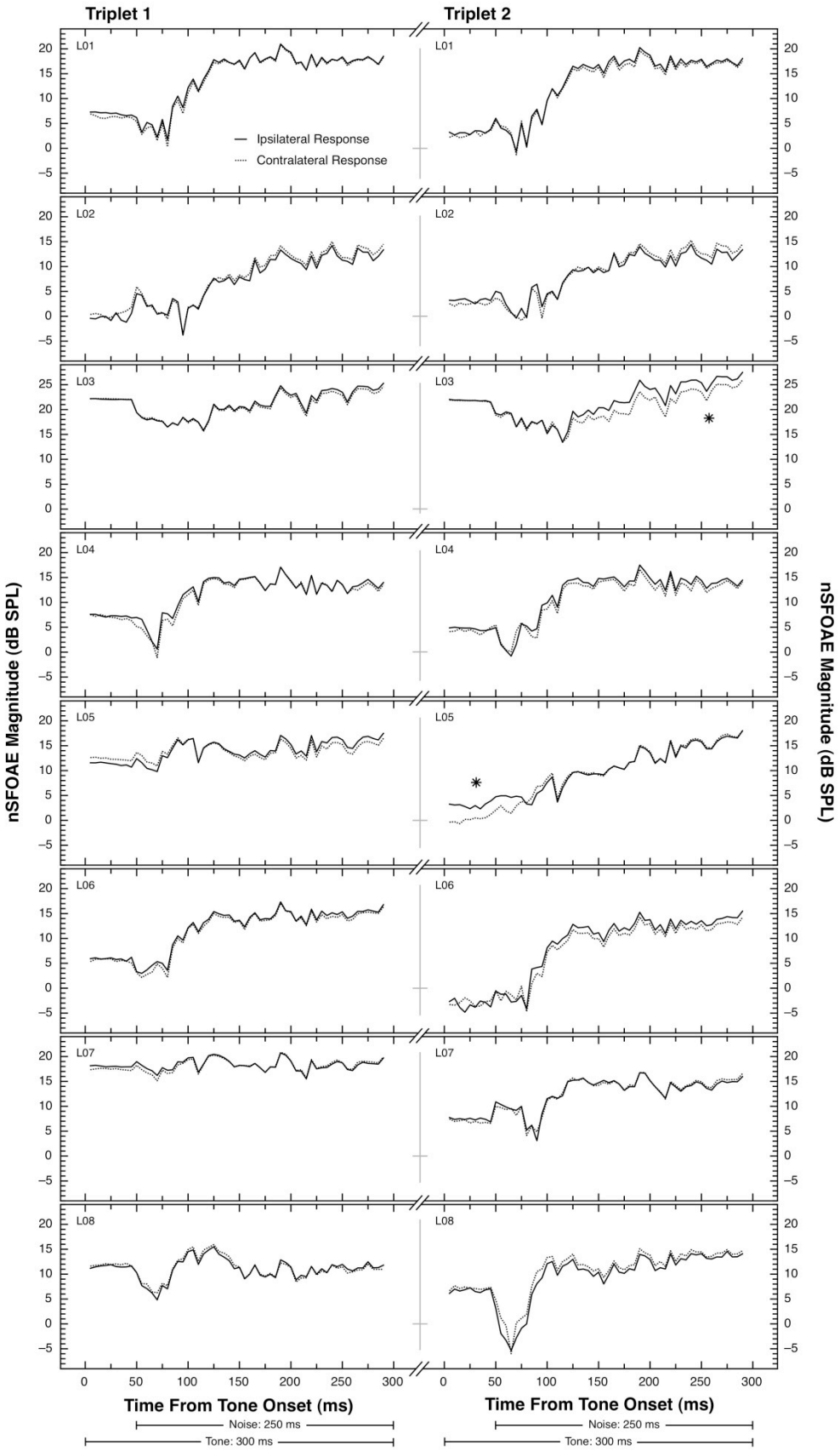
Triplet 1
Triplet 2
L01
L02
L03
L04
L05
L06
L07
L08
Ipsilateral Response
Contralateral Response
nSFOAE Magnitude (dB SPL)
nSFOAE Magnitude (dB SPL)
Time From Tone Onset (ms)
Time From Tone Onset (ms)
Noise: 250 ms
Tone: 300 ms
Noise: 250 ms
Tone: 300 ms

Figure S2: Averaged nSFOAE responses from repeated measures of the dichotic-listening condition. The data from Triplet 1 are shown on the left side of the figure, the data from Triplet 2 are shown on the right side of the figure, and each horizontal pair of panels contains the data of an individual subject. The solid line in each panel shows the averaged ipsilateral response (right ear attended), and the dashed line shows the averaged contralateral response (left ear attended). During the first 50 ms of the response, only the 4.0-kHz tone was present (at 60 dB SPL); during the next 250 ms, both the tone and a wideband noise (0.1 – 6.0 kHz, about 63 dB overall) were present. For the majority of subjects, there was no effect of differentially attending to the two ears; the exceptions were the tone-plus-noise responses of L03 in triplet 2, and the tone-alone responses for L05 in triplet 2 (indicated by an asterisk). For each subject, the responses during the visual-attention task were similar to those shown here; no significant differences were observed between the “ipsilateral” and “contralateral” response waveforms.

Table SII: Reaction Times in the Visual Conditions, by Trial Outcome

	Condition:	Inattention without SSN	Inattention with SSN	Visual Attn. without Speech	Visual Attn. with Speech
Subject					
L01	All Trials	305.5	458.2	1274.3	1309.3
	Correct			1259.5	1279.3
	Incorrect			1501.2	1723.0
L02	All Trials	1466.9	1311.9	1136.8	1227.7
	Correct			1130.2	1196.0
	Incorrect			1170.6	1387.0
L03	All Trials	793.5	865.2	1137.6	1180.5
	Correct			1112.9	1170.6
	Incorrect			1597.4	1352.0
L05	All Trials	416.6	749.0	1139.6	1161.6
	Correct			1140.9	1157.5
	Incorrect			1017.1	1632.8
L06	All Trials	656.6	705.3	1267.6	1199.8
	Correct			1241.0	1180.3
	Incorrect			1580.8	1385.0
L07	All Trials	233.6	383.4	1382.9	1392.4
	Correct			1374.3	1369.9
	Incorrect			1422.4	1494.4
L08	All Trials	427.7	455.6	1281.2	1356.5
	Correct			1262.2	1336.6
	Incorrect			1498.5	1523.4
AVG (n=7)	**All Trials**	**614.3**	**704.1**	**1231.4**	**1261.1**
	Correct			**1217.3**	**1241.5**
	Incorrect			**1398.3**	**1499.7**

Table SII: Average reaction times (ms) for the 7 subjects in the visual-attention conditions. For each subject and each condition, RTs were averaged across all trials, and for correct and incorrect trials separately. For the two inattention conditions, all trials were scored as correct; those data are shown in the middle two columns. The data for the corresponding attention conditions are shown in the two rightmost columns. Whether speech or SSN was presented to the ears in addition to the nSFOAE-evoking stimulus is marked at the top of the column for each condition. Average RTs across all subjects are shown at the bottom of the table. RTs for the inattention conditions were significantly faster than in the attention conditions. RTs were not significantly different between the two inattention conditions, nor between the two attention conditions.

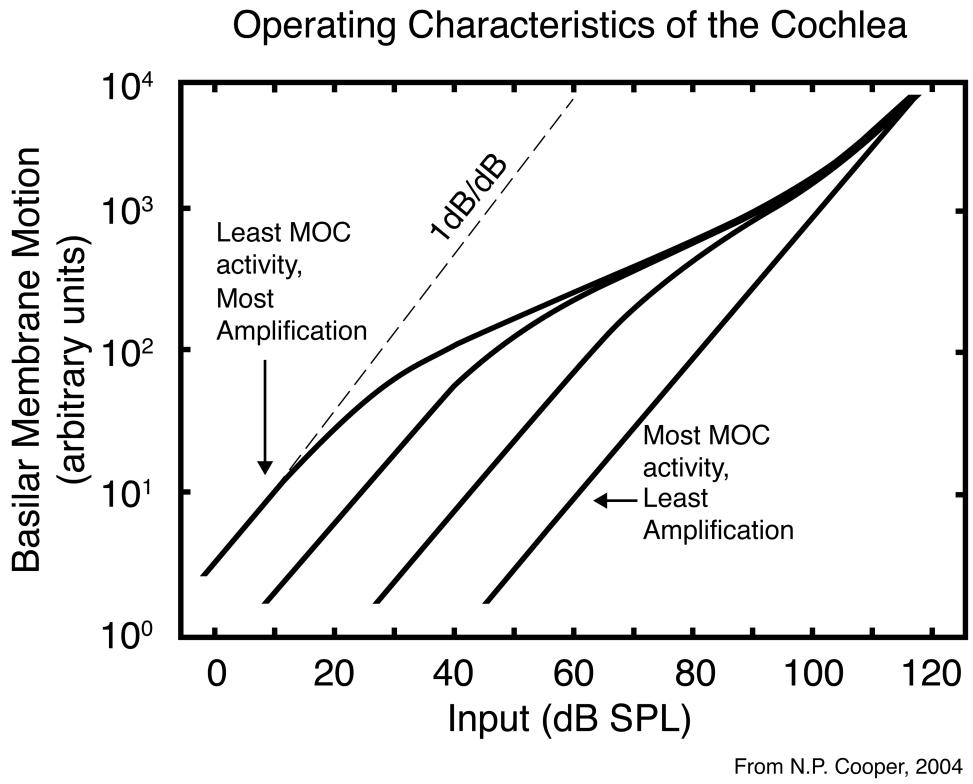

Figure S3. The input/output function of the basilar membrane that is operative at a particular moment in time depends upon several factors. Among these is the current level of activation of the MOC efferent system. When the MOC system is minimally active, then the cochlear-amplification mechanism is maximally active, and the operating characteristic is maximally compressive (left-most function). When the MOC system is more active, cochlear amplification is reduced accordingly, and the operating characteristic is less compressive. When the MOC system is maximally active, there is no cochlear amplification, and the operating characteristic becomes linear (right-most function). Figure by S. Douglas Mitchell; adapted from N.P. Cooper (2004).